Cell biology: (Dr. Olena Voronina, room 516)

1. Cell theory
2. History of cell biology: Who invented the microscope, discovered cells, first described the nucleus.
3. Cytoplasm and cytoskeleton.
4. Organelles: membranous and non-membranous; their structure and functions.
5. Differences between pro- and eukaryotic cells.
6. Differences between plant and animal (human) cells.

Molecular biology: (Dr. Andriy Sivolob, room 464)

1. The complementarity of bases in nucleic acids
2. The mosaic gene structure in eukaryotes: exons and introns
3. The steps of gene expression
4. Enzymes that are involved in DNA replication
5. Regulatory proteins that are involved in the transcriptional control
6. Changes in number of DNA molecules during the cell cycle
7. The phases of mitosis
8. Morphological types of mitotic chromosomes: differences in centomere location
9. Types of chromosomal mutations
10. The origins of mutations and the role of DNA repair in the maintenance of genetic information

Genetics: (Dr. Iryuna Kozeretska, room 465)

1. Genetics challenge – Tay-Sachs syndrome.
2. Genetics challenge – Rh-factor.
3. Genetics challenge – autosomal recessive inheritance.
4. Genetics challenge – arachnodactyly.
5. Genetics challenge – pigmentation.
6. Genetics challenge – MN and ABO blood groups.
7. Genetics challenge – color blindness.
8. Genetics challenge – Barr body.
9. Genetics challenge – hemophilia.
10. Genetics challenge – blindness.
11. Genetics challenge – sex-linked inheritance.
12. Genetics challenge – population allele frequency.

Embriology: (Dr. Olena Voronina, room 516)

1. Gametogenesis: spermatogenesis, oogenesis. Types of cell in different stages. When does gametogenesis begin in the course of ontogenesis?
2. Structure of human sex cells.
3. Types of egg cells.

4. Capacitation.
5. Fertilization. Block to polyspermy.
6. Cleavage. Holoblastic and meroblastic. Pattern of cleavage in humans.
7. Blastula. Types of blastula. Human blastula.
8. Gastrulation. Cellular movements during gastrulation.
9. Parts of human gastrula. Development of placenta.

Parasitology: (Vladlen Trokhymets, room 319)

1. *Entamoeba histolytica* (amoebiasis).
2. *Trichomonas vaginalis* (trichomoniasis).
3. *Trypanosoma brucei* and *Trypanosoma cruzi* (Sleeping sickness and Chagas disease)
4. *Leishmania sp.* (leishmaniases).
5. *Plasmodium sp.* (malaria).
6. *Fasciola hepatica* (fasciolosis).
7. *Opisthorchis felineus* (opisthorchiasis).
8. *Schistosoma sp*. (schistosomiases – Katayama fever, genitourinary schistosomiasis, gastrointestinal schistosomiasis, central nervous system schistosomiasis).
9. *Taenia saginata* and *Taenia solium* (taeniasis and cysticercosis).
10. *Echinococcus sp.* (echinococcosis, or hydatidosis – cystic echinococcosis and alveolar echinococcosis).
11. *Ascaris lumbricoides* (ascariasis).
12. *Enterobius vermicularis* (enterobiasis).
13. *Trichinella spiralis* (trichinellosis).
14. Life cycle of blow fly (*Wolhfahrtia magnifica*), *Pediculus humanus* capitis.
15. The disease caused by *Demodicosis sp.*, mite (scabies), lice and *Ornithodorus papillipes*.

Evolution and Ecology: (Andriy Pustovalov, room 516)

1. What is the Hardy–Weinberg principle? What conditional of its realization you know?
2. What is the macro- and microevolution? Which properties of these processes you know?
3. What is the phylogeny and evolution?
4. What is the artificial and natural selection? The definition and properties.
5. What is the types of evolutionary competition and its consequences?
6. Which types of natural selection by I. I. Schmalhausen you know? What is the difference between Stabilizing, Directional and Disruptive selections?
7. What is the most important forms of human's ancestors and relatives species you know?

8. What is the Ecosystems? What are the producers, consumers and detritivores?
9. What types of bioms you know?